

THE SIGNAL

Newsletter of the Bella Vista area Radio Club



September 2022

Monthly Meetings: 1st Thursdays @ 7 p.m.
Arkansas Law Enforcement Training Academy (ALETA)
3424 S. Downum Road, Springdale AR

Club Call: N5BVA • Repeater: 147.255 +offset, pl 162.2
Website: www.bellavistaradioclub.org

WEEKLY NETS:

- 3.830 kHz Roundtable
Sundays @ 4 pm during CST, 4:30 during CDT
- 147.255 BVRC Legacy Net - Wednesdays @ 8 pm
- Wide Area Net - Tuesdays @ 8 pm on the
NWA Skywarn Link System
Bentonville – 146.865, -offset, pl 103.5
Fayetteville – 147.315, +offset, pl 97.4
Huntsville – 443.625, +offset, pl 97.4
Green Forest – 145.310, -offset, pl 103.5

NEXT BVRC MONTHLY MEETING

THURSDAY, SEPTEMBER 1, 2022 @ 7PM
ARKANSAS LAW ENFORCEMENT TRAINING ACADEMY
3424 S. DOWNUM ROAD
SPRINGDALE, AR

SEPTEMBER MEETING INFORMATION

The Bella Vista area Radio Club has hosted many fine meetings on different areas of amateur radio operation. But for the September meeting, we're in for a real treat as BVRC member Jan Hagan – WB5JAN for the first time unveils the challenging, rewarding, and especially fun operation of Parks On The Air (POTA).

After an absence from amateur radio for over thirty years, Jan has recently rejoined the amateur radio ranks by passing his Technician exam and earning the callsign KI5SYS, later passing his General and acquiring vanity call WB5JAN. In earlier years, Jan didn't have a lot of opportunity for radio, as his spare time was taken over by career and family obligations. But now in retirement, he has the time to renew his interest and involvement in amateur radio, photography, and RV travel. Jan says he hopes his three main interests will merge seamlessly as he plans future trips to enjoy all of those interests.

Jan was born and raised in San Diego, California and his previous call was KE6BY. He worked 2-meters on the wide coverage repeaters in the San Diego County mountains, using autopatch to stay in touch with his family and friends. For HF, he ran an old Heathkit HW-104 to a random wire hidden along a fence outside his modest apartment building.

Jan told us, "Hopefully, we will have a chance to catch each other from the modest radio shack in my storage room featuring my FT-891 into a "MyAntennas" EFHW 80-10 sloper up about forty feet off the ground.

Don't miss this opportunity to learn what POTA is and how it works, as BVRC welcomes Jan to the speaker's platform! See you there!

EXCITING DIGITAL MODE OF FT8 FOCAL POINT OF AUGUST MEETING

Bella Vista area Radio Club experienced its largest attendance since moving into our new facility at the ALETA building on August 4, as members packed the meeting room to experience a fine presentation from Scott Branyan – W5AAJ on “Chasing DX on FT8 and FT4”. An even 60 members came for a great meeting with a great program and great door prizes.

Scott began the presentation by reviewing the history of the present and ultra-popular mode of FT8. The mode was invented by Joe Taylor – K1JT of Princeton University. Joe developed an all-digital mode platform/software program in 2001, naming it WSJT. He then improved the existing digital modes used in the program in 2005, and also added new ones (ex: JT65, PSK). FT8 was added to the new program, now called WSJT-X, in 2019, which incorporated a little wider signal, but was twice as fast as its predecessors. The rest is history...FT8 has exploded globally, now being used by hundreds of thousands of hams.





Scott said one of the reasons it has become so popular is due to the sunspot cycle being on the low end when it was first introduced, which made FT8's paramount feature of being able to pull-in weak signals shine. It is also relatively easy to incorporate FT8 into one's station, as it only takes a radio, antenna, sound card, and a PC.

He shared that many amateur radio achievement awards can be pursued with a great degree of success with FT8: WAS (Worked-All States), Five Band WAS, DXCC (DX Century Club), Five Band DXCC, SOTA (Summits on the Air), POTA (Parks on the Air), Grid Squares and Counties.

Scott said that many times he has had a station call him, appearing on his computer screen, when his pan adapter doesn't even register their signal as being present, once again illustrating the remarkable ability of this digital mode to pull-in weak signals.

Scott related that is very important to know your radio and its settings to successfully operate FT8, such as selecting a fast AGC and turning-off optional filters such as the Noise Blanker. He then reviewed the call sequences that FT8 and FT4 use. He also highlighted the proper technique in using the correct messages during an FT8 QSO.

Some good tips in using FT8:

- Scan the bands
- Use propagation when it's in your favor
- Notice who the DX station is calling
- Call selectively
- Watch for special signs/messages from the DX station (such as moving to Fox/Hound mode)
- Learn to deal with QRM
- Don't forget to log your QSOs

The Fox and Hound mode of FT8 is widely used by DXpeditions, where the DX station is the 'fox' and you are the 'hound'. This mode enables DXpeditions to work QSOs more quickly and efficiently, which is a win-win for everyone.

To conclude the program, Scott suggested some of the more popular software programs to use for pursuing DX on FT8 and FT4: Logbook of the World, DX Atlas, and Dimension-4 which is a synchronizing program for your computer clock and very important for working the FT8 mode.



**President Tom Northfell – W5XNA presents
Scott Branyan – W5AAJ with the BVRC Program
Certificate of Appreciation**

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From the Desk of the President



Welcome members to the September 2022 issue of The Signal - the monthly newsletter of the Bella Vista Radio Club produced and edited by Don – K5DB. Articles and photos for the newsletter are always appreciated, and thanks.

Thanks to the several new members of BVRC. We hope that you will become actively involved in the club and our great hobby. Welcome aboard!

Special thanks also goes to Scott Branyan – W5AAJ for his excellent presentation on chasing DX using the FT8/FT4 modes. VY FB!

September Club Meeting – This month's meeting will feature a presentation chasing Parks on the Air (POTA) by BVRC member Jan Hagen – WB5JAN. He has been very successful making POTA QSOs. This is another presentation that you don't want to miss. I encourage everyone to invite friends and neighbors to our meetings. Guests are *ALWAYS* welcome.

Accelerated Amateur Radio License Class

Congratulations to the Accelerated Technician License Class of 8/21/2022! We are excited for you and look forward to helping get you on the air. Thanks to everyone who helped spread the word about the class, those who came early and stayed late to help, and the amazing work of the VE team. Also, thanks to John Nordlund – AD5FU for spending his weekend in NW Arkansas to instruct the class. A special thank you goes out to Gregg Harrison – KF5WAP and Shannon McCuin – KI5WUD (Shannon is one of the new Techs from the accelerated class!) and the ALETA Northwest for hosting this event. (More information in this month's issue of *The Signal*).

Newcomer Meetings

Bella Vista Radio Club is here for all newcomers to our great hobby. We want to help you get on the air and to be active. Consider attending our special Newcomer Meetings. These are question and answer sessions to help introduce newly licensed hams to radio equipment options, station setup considerations, finding an elmer, protocols and procedures, Morse code, digital modes, and other areas of amateur radio. Bring your questions and we'll do our best to answer them for you! The premiere Newcomer Meeting will be at 6 pm, preceding the BVRC regular meeting on September 1. Come and join us for both!

Elmer 9-1-1 Reminder

Do you have a radio-relation question? Use the Elmer 9-1-1 tab on our website. Fill out the online form and one of our elmers (mentors) will get back to you with an answer.

On the Air - BVRC Weekly nets (detailed information on the BVRC website)

- Tuesday - Wide Area Net 8 pm - NWA Skywarn Liked System
- Wednesday - 2m Legacy Net 8 pm
- Sunday - BVRC 75 Meter Round Table 4:30 pm

BVRC Planning Calendar

- Joplin ARC Hamfest Sep. 30 - Oct. 1
- BVRC Nomination Committee - October
- BVRC Holiday Banquet and Awards (December 1
- BVRC 2023 Club Election

73! — Tom, W5XNA

BVRC ACCELERATED TECHNICIAN CLASS ENJOYS SUCCESSFUL EVENT



Instructor John Nordlund – AD5FU conducts the Accelerated Technician Class

Twenty new Technician class licensees went home with smiles on their faces Sunday afternoon, August 21, at the conclusion of the BVRC Accelerated Technician Class that convened during the August 20-21 weekend. The class was held at the club's regular meeting facilities at the ALETA building in Springdale. John Nordlund – AD5FU from Redfield (s. of Little Rock) was the instructor. John is a regional icon in Technician License classes. He has traveled all over Arkansas and the mid-south devoting his own time and spending his own money to help interested individuals in obtaining their first ham license and help launch them into our great hobby.

The BVRC VE team did an excellent job of processing and grading the exams, as well as reaching out to the new licensees, and advising them of the tools and potential help from within BVRC to help get them started on the right foot with their new license. Other club members and officers were present and did a great job of helping out with exam session monitoring, assisting anyone wishing to join BVRC, and facility clean-up after the event.

It was a total team effort, and a huge thanks goes to everyone who was present to make this a rewarding weekend. A special thanks to Gregg Harrison and Shannon McCuin of ALETA for helping BVRC host this special licensing event.

The Club has instituted gatherings, when needed, for all newcomers and will be implementing the first one for these new hams prior to the September club meeting on Sept. 1. We look forward to hosting these Newcomer Meetings, to provide them with a fruitful starting point as they begin their journey in amateur radio.



John – AD5FU kicks-off the Sunday morning session of the ATC



A portion of exam grading and processing
by the stellar BVRC VE team



BVRC VE REPORT

From Don Cooper – KC7DC, BVRC VE Coordinator
August 13, 2022



Congratulations ! ! !

Michael Kemper – KI5WRC - Fayetteville
New Technician!

David Benson – KI5WHF – Huntsville
New General!

Wendell Oals, Jr. – KI5VXZ – Lowell
New General!

James Bohannon – KI5WUO – Springdale
New General!

Ryan McGuffin – K5XDR – Rogers
New Amateur Extra!

Test sessions are conducted each 2nd Saturday of the month:
• 2 pm at Bella Vista Fire Station #1, 103 NE Towncenter, Bella Vista
• 10 am at Shiloh Museum, 118 W. Johnson Ave, Springdale

**Help promote the availability of the Club's monthly test sessions.
Tell your friends and acquaintances!**

MEET BVRC's VE TESTING COORDINATOR!

One of Bella Vista area Radio Club's most valuable and crucial officer positions is the Club's Coordinator of our monthly Volunteer Examiner amateur radio test sessions. BVRC is certainly blessed with a dedicated and competent individual that serves in this capacity, Don Cooper – KC7DC. We are featuring Don in this issue of The Signal, so that you might get to know this gentleman of the airwaves a little better!

Don's position is not only a critical one, but very rewarding as well. He and the BVRC VE team have the opportunity to experience the excitement and gratification of test candidates when they pass their Technician, General, or Amateur Extra exam! Although the main goal of the BVRC team is to make the testing atmosphere as comfortable and helpful for them as possible, each candidate is always extended an invitation to join our Club, if they wish.

Don was first licensed in March 2015, in Federal Way, WA (Seattle/Tacoma area). He passed BOTH his Elements 2 and 3 and earned his General ticket that day. "I was initially assigned KG7THY," Don told us. "After upgrading to Extra class, I applied for and was issued my current call, KC7DC."



Don – KC7DC

Don said he first became interested in radio in the 1970s. "Like everyone else around that time, I had a CB radio in my car and had a lot of fun with it. I was aware of amateur radio, knew it was capable of communicating around the world, and thought that sounded like a lot more fun. Unfortunately, I didn't know anyone in the hobby and didn't have a clue where to start. (Remember, this was long before the internet.) I picked up a study guide at the library and was able to follow most of the electronics and radio theory, but then I ran into the Morse code "roadblock". I gave it a shot for a few weeks, but wasn't really making any progress. So, my interest in ham radio waned and as often happens, life got in the way – career, marriage, kids, back to college for a new career, etc., and suddenly 40 years had passed. THEN, I saw an announcement for a free amateur radio license class, sponsored by a local amateur radio club. Well, "Sign me up!" It was a great class, and after 2 consecutive Saturdays and a week of studying between, I was able to pass the Tech and General exams.

When asked what his favorite side of amateur radio is, Don replied, "My favorite on-air activity is DX'ing. As I mentioned before, for me that first spark of interest in amateur radio was the idea of being able to communicate over the air with people in other parts of the world. I made my first DX contact in March 2020 with Martinique, and at that point I was hooked. In the 2-1/2 years since, I've logged phone contacts with 188 countries and confirmed 167. Every time I get an "ATNO" (All Time New One), it's a thrill to enter it in the log, and almost as big a thrill when the QSL card comes in the mail. I also enjoy looking them up on Google maps and reading a little bit about the places I've been able to contact."



"I think the most rewarding part of the hobby for me, is when I get to be the first to congratulate a new ham when they pass their Tech exam and earn their first license. I enjoy being part of the BVRC VE team, and when Glenn – WB5L was looking for someone to step-in and take over as VE Team Liaison I jumped at the chance. It's been a great experience and I hope to be able to do it for a long time. We are always looking for new members of the team, and I would encourage anyone looking for a really fun and rewarding way to give back to the hobby to get in touch with me."

Don says his most memorable contact on the air was with a gentleman named Dave in England. Don was tuning around on 20-meters early in the morning and heard him calling "G4AKC stroke BM". Don had to find out what that was about, so he gave Dave a call and the British station responded. It turned out the "BM" appendage on Dave's call stood for "Bicycle Mobile". Dave was making contacts while pedaling along the English seashore. That was Don's first DX contact with a mobile station, and he thought it was pretty unique.

Don is happily married and in a few month he and his XYL, Kim, will celebrate their 47th wedding anniversary. A big 'CONGRATULATIONS', Don!

He says, "Kim has shown about as much interest in my radio hobby as I do in her quilting. She does participate by posting the monthly VE Testing Report to the club Facebook page. The only social media I do is amateur radio."

And speaking of radio, Don has a fine station at his QTH. His main transceiver is an Icom IC-7300 with the new Mercury III linear amplifier that runs 1200 watts. Atop his tower is the exceptional SteppIr DB-18 beam, which operates on 40 through 6 meters.

When it comes to other hobbies in Don's world, he has been involved with woodworking for many years. He enjoys making things for family and friends. Some of his projects have included a set of folding TV trays for his mother-in-law, a display rack for his grandson to display his baseball tournament rings and medals, replacement drawers for a friend's antique sewing cabinet, and a full set of kitchen cabinets for his wife. He has also managed to build a few small pieces for my shack. "I'm also an avid reader, mostly of political thrillers, mysteries, and police procedurals. I probably average 3 books a week," Don said.

Don, thanks so very much for the marvelous job you for amateur radio and BVRC, along with your great VE team. We appreciate you immensely, and count it an honor that you're in the BVRC family!





Welcome New BVRC Members!!!

RON KOELLING – K5RGK – JAY, OK
JOE DUNN – WA5JD – SPRINGDALE
DENNIS BAILEY – W5DLB – FAYETTEVILLE
PAUL LeBLANC – W5AB – FAYETTEVILLE
SHANNON McCUIN – KI5WUD – FARMINGTON
MICHAEL CALVI – KF5RU0 – BENTONVILLE
EARL CUNNINGHAM – AI5YY – ROGERS
DUSTIN SERIO – KI5WHI – PEA RIDGE

SPECIAL ANNOUNCEMENT

Beginning Aug. 7, the **BVRC Sunday afternoon Roundtable** on 3.830 MHz, began a new starting time schedule. During Central Daylight Time hours, the Roundtable will convene at 4:30pm with the pre-Roundtable check-in period beginning at 4:00pm. During Central Standard Time hours, the Roundtable will convene at 4:00pm with the pre-Roundtable check-in period beginning at 3:30pm. This is to facilitate copyability between participating stations during the shorter propagation of late spring, summer, and early fall. If you have HF privileges and capability, be sure and check-in for a fun and educational time!



BVRC is always interested in our members' comments, suggestions, critiques, and ideas on how to make our club better! If you have any feedback for the club, e-mail your club leadership [here](#).

If you have any feedback for The Signal, submit your e-mail [here](#).

Working 2-meter Single-Sideband



By Mike Schoeder - NØALJ

I had always wanted to try 2-meter SSB but my current antenna setup, and living in a subdivision, kept me from putting up a tower for a horizontal 2-meter SSB Beam Antenna and a rotator motor. But since I learned about the Par Electronics OA-144 2-meter SSB Omniangle antenna, I was ready to give this mode a try. I had a Kenwood TR-751A in my closet ever since I last used it in the 90's to work the RS-10 and RS-11 Satellites (where you uplink on 2-meter SSB and downlink on 10-meter SSB) but those satellites are no longer in operation. This was a project to bring new life back to my old Kenwood TR-751A and has been on my ham radio "bucket list" of modes to try before I die.



I was impressed that Dale at Par accepted personal checks and that this antenna was priced at under \$100.00. It's small in size providing omni-directional coverage and its design has a built-in balun to prevent feed line radiation and allows for operation in the rain without concern of SWR swings!

So, I ordered 50 feet of LMR-400 coax from DX Engineering and put it up on Friday afternoon of the 2022 Memorial Day weekend. I also wanted to be in time for the June VHF contest which would mean more stations than usual to work. This antenna was plug and play! It comes pre-tuned and had a perfect match for SWR on the SSB portion of 2-meters. The 2-meter SSB calling frequency is 144.200 MHz. Some stations call CQ with voice and some call CQ with CW. I like how the Kenwood has a squelch so that the radio is quiet until activity is heard, and it has a very sensitive receiver. This radio also has an old analog S-meter which reminds me of my old CB days where 11-meter radios had analog S-meters before I became a ham. Dale is a great engineer. Those of you who were CB'ers may remember the great CB base antenna known as the Avanti Astroplane. I personally had one of those great antennas as many others did. This CB antenna was also designed by Dale of Par Electronics!

I was amazed at what could be done with just 25 watts on 2-meter SSB (the maximum power of the Kenwood TR-751A). Ed – KCØDX also told me that there are 2-meter SSB Nets on 144.250 MHz at 8:00pm on Tuesday, Wednesday, Thursday, and Friday nights from Kansas, Texas, and Missouri. I think I am really going to like 2-meter SSB and looking forward to exploring these nets. It does take a little patience and best contacts are made during 2-meter propagation. At this time of year – spring and summer – the early morning hours are usually best times to get on when it's cooler in the mornings but I will learn more as I explore this mode more over time. Here is a list of stations worked over the 2022 Memorial Day weekend (some worked with just 5 watts too, like Joplin, MO.):

WD9BGA, Carl in EN53 - Barneveld, WI.!

K2DRH, Robert EN41 - Albany, IL.!

KCØDX, Ed EM26 - Bentonville, AR.

KEØQWP, Ian EM27 - Joplin, MO.

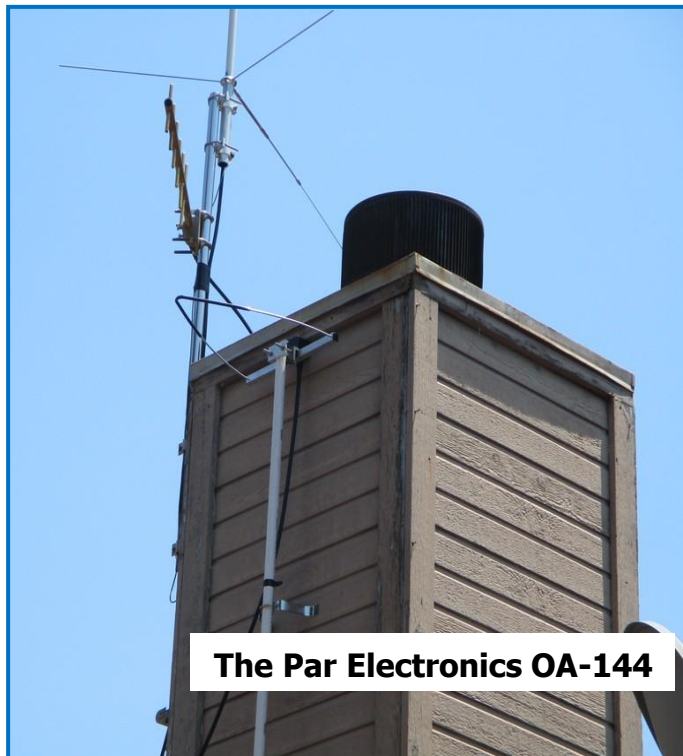
K5SW, Sam EM25 - Muskogee, OK.

N5AFY, EM15 - Sapulpa, OK.

W5LDA, Larry EM15 - Mounds, OK.

If you're interested in this antenna, here's the web address: <http://www.parelectronics.com/omnis.php>

73 – Mike



The Par Electronics OA-144

ALPENA HIGH SCHOOL RADIO CLUB FIELD DAY



BVRC members Vinson Carter and Don Banta travelled to Alpena High School for ARRL Field Day 2022, to assist the radio club kids gain an understanding of setting-up and operating a portable station. They operated as 1-Alpha, Arkansas and the students enjoyed experiencing all the popular HF modes – SSB, CW, and FT8 using their club call – W5AHS.

Although Elizabeth Surface – KI5HOQ was not present, the photo shows (from left to right): Brayden Lewandowski-KI5VLG, Vinson-WV5C, John Jones-W5OX (advisor), Alan Nix-KA5NIX (in-house instructor and sponsor), Don-K5DB (advisor). *Photo courtesy Shelly Stone-KE5DX (advisor)*



BVRC MEMBER ATTENDS ARRL TEACHERS INSTITUTE



In July Vinson Carter – WV5C, BVRC's Elmer 9-1-1 Coordinator, participated in the ARRL Teacher Institute on Wireless Technology (TI-1) in Dayton, OH. The 5-day workshop was held at the Dayton Amateur Radio Association (DARA, club callsign W8BI) headquarters with 11 teachers in attendance from across the nation. The course was taught by Larry Kendall (K6NDL) who has been an ARRL Education and Program Instructor since 2014.



2022 ARRL TI-1 Graduates from L to R: Brian Geffre – K0GEF, Martha Bowman – KD9VNX, Bob Brady – K5RPB, Sherri Carattini – KI5TLA, Sue Tyner – KE8EUJ, Vinson Carter – WV5C, Kathleen Holley – KG5CVO, Allen Lombardozzi – KC3TGY, Dave Becar – KI6OSS, Sheri Becar – KI6WWN, and (in front) Melissa Erickson – KEØWNH.

The Teachers Institute is an expenses-paid professional development program consisting of lectures and hands-on activities intended to provide educators with tools and strategies to introduce basic electronics, radio science, satellite communications, amateur radio, and microcontrollers in the classroom. The participants had an opportunity to learn more about wireless technology and collaborate about how to bring that knowledge to their students.





Vinson in the W8BI shack

Some of the activities during the class included soldering an FM radio, trouble-shooting with an oscilloscope, foxhunting, and working satellites. During the week participants had the opportunity to attend a DARA VE session to get their initial or upgrade their amateur radio license. Vinson plans on applying to attend TI -2 in 2023.



The DARA clubhouse and W8BI station

DON'T FORGET OUR VHF/UHF WEEKLY NETS!

BVRC WEEKLY 2-METER LEGACY NET

The BVRC weekly 2-meter Legacy Net meets each Wednesday evening at 8pm local time on 147.255 / pl tone 162.2. You do NOT have to be a BVRC member to participate. All licensed amateurs are welcome to join us for on-the-air fellowship and good discussions. This is an excellent way for all new hams to become accustomed to operating protocol and procedure, and gain experience in operating through a repeater. Join-in on the fun!

BVRC WIDE-AREA NET

The Wide-Area Net meets each Tuesday evening at 8pm local time on the NW Arkansas Skywarn Link System. All licensed operators in the NW Arkansas/SW Missouri/NE Oklahoma area have a standing invitation to join-in on great discussion topics, announcements of upcoming events, good ol' VHF/UHF fun, and sometimes very useful information on this net. Hams from all over the area participate in this net, and a good time is experienced by all each week. **NEW HAMS ARE ESPECIALLY WELCOME!** You can access the linked system through any 1 of 4 repeaters. The list of the repeaters used in the linked system can be found [here](#). See you then!



(Editor's note: BVRC member Robert Hill – K5NZV was so inspired by the great program presented at the April meeting by Murray Harris – W5XH on operating through amateur satellites, that he constructed his own homebrew hand-held antenna. He has been kind enough to share this article with us on its construction and use.....)

AN INEXPENSIVE HOMEBREW SATELLITE ANTENNA

By Robert Hill – K5NZV

On a Sunday afternoon shortly before the wife (Dana – W5DGH) and I went on our trip to Maine, I engaged on a project to construct a homemade satellite tracking antenna.



I split the two sides and added an MFJ duplexer. Also, I received a Father's Day gift a little early – a Wouxun KG-UV8D+ HT that has cross-band repeater ability and performs full duplex (can transmit on one VFO while still listening on the other). I discovered how much difference little things like wire nuts on the ends of the elements will make on SWR, but experimentation is part of the fun.

I have an app on my phone called “Amateur Radio Toolkit” which I used for the original radial measurements. The 2-meter elements are spaced about 10 inches apart and the 70cm about 4 inches. It tested ok for the 70cm side, but I couldn't get the 2-meter side to tune, so I went back to the formulas:

Reflector: $148.4/f$

Driven element: $141.8/f$

Director: $131.9/f$

I also used metric measurements the second time instead of standard. It worked-out to be a little more accurate and fewer conversions. Using those formulas they came out to (in meters):

Reflector 1.017m

Drive 0.9718m

Director 0.9040m

I then used a NanoVNA to analyze it and found that the lowest SWR reading was about 400 kHz below where I wanted it so I used a trick I learned making dipoles last year - multiply that frequency by the length to get a new dividend, divide by the desired frequency to get a new length, and trim it to that length. Example:

Original drive length: $141.8 / 145.9 = 0.9718\text{m}$

$145.5 \times 0.9718 = 140.4$

$140.4 / 145.9 = 0.9623\text{m}$

I spent about 5 or 6 hours on it, but some of that was scrounging parts and stripping the wire out of a piece of Romex I had rolled up in a box from a project years ago, as I pulled the bare ground out and cut the radials to length as I went.

I still have a little more "cosmetic" work to do with it, but I did receive my first satellite, SO-50. I think the terrain around my QTH is not helping, as I am on the west side of a hill with lots of trees all around and power lines on two sides. I am still having quite a fun time with it.



Horizontal orientation



Vertical orientation

Here is the parts list I used for the antenna's construction:

- About 42 inches of 1x2 pine furring strip (an 8 footer is \$1.98 at Lowes; need less than four feet so figure half that)
- 16 - 1/2 inch sheet metal screws @ \$0.07 each
- 10 gauge copper wire that I had in a box in the attic (or you could use some old wire clothes hangers)
- About 8 feet of RG8X that I bought at this year's Claremore hamfest – paid \$1.00 for about a 20-foot piece
- PL259 connector
- Zip ties

Thanks for a super and informative article, Robert, and happy satellite hunting!

Hedy Lamarr

**Hollywood Star or Radio Scientist?
Why Not Both?**

"Samson and Delilah" co-starring with Victor Mature. What many people are unaware of, however, is that she also co-developed one of the most crucial scientific developments of our time.

Along with many other clever solutions, she co-invented an early technique for *spread spectrum communications*.

This was critical to the many wireless communications of our present day. According to Melanie Phillips (2018), Hedy referred to her project as the "secret communications system" and began developing it around World War II. Her "SCS" was originally designed to help subs fire torpedoes. These were powerful but difficult to control weapons, and they could often go off course, and damage or even hit the wrong target. There was a desperate need for a system that could reliably control these torpedoes. **She found her answer in radio systems.**



At the outset, radio contact was used between the torpedo and the submarine or ship that it was fired from. This required a great deal of control. However, if the opposing forces figured out what frequency the torpedo and the ship were communicating on, they could just block (jam) that frequency. Control would be lost, and the torpedo would go off course. Hedy and a composer, George Antheil, solved this issue and created a system that allowed the two vessels to communicate by jumping between different radio frequencies. Due to the ever-changing frequencies, the connection became impossible to intercept and the problem was solved!

At first, her idea was laughed at by the U.S. Navy, who told her to "go back to being an actress". However, it was Hedy who had the last laugh. Eventually, the U.S. military realized just how invaluable her invention truly was, which is now known as "frequency hopping" or *spread spectrum emission*, of which she did acquire a patent for. Hedy proved that anyone can be an inventor, if you have the drive and passion to make it work! Her system allowed for the much-needed security during World War II, but over time it became the foundation of military communications, cellphones, and bluetooth! Much of our wireless devices in use today all owe their thanks to Hedy Lamarr and the power of radio!

(Article adapted from <https://www.womenshistory.org/education-resources/biographies/hedy-lamarr>)

Check-out the PBS video about Hedy [here](#).

The Basics of High Frequency Vertical



and Beam Antennas

By H. Ward Silver – NØAX

At high frequencies, ham radio antennas can be fairly large. An effective antenna is usually at least $\frac{1}{4}$ wavelength in some dimension. On 40-meters, for example, a $\frac{1}{4}$ -wavelength vertical antenna is a metal tube or wire 33 feet high. At the higher HF frequencies, antenna sizes drop to 8–16 feet but are still larger than even the old-style TV antennas.

Your physical circumstances have a great effect on what antenna you can put up. Rest assured that a large variety of designs can get you on the air.

Verticals and beams are two of the three basic HF antennas (the first being the wire antenna) used by hams all over the world. You can build these antennas with common tools or purchase them from the many ham radio equipment vendors.

VERTICAL ANTENNAS

Vertical antennas are nearly as popular as wire antennas. The $\frac{1}{4}$ -wavelength and $\frac{1}{2}$ -wavelength antennas are two common designs. Verticals don't require tall supports, keep a low visual profile, and are easy to move or carry. Verticals radiate fairly equally in all horizontal directions, so they're considered to be *omnidirectional* antennas.

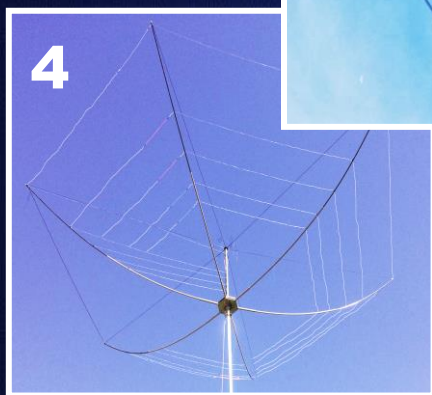
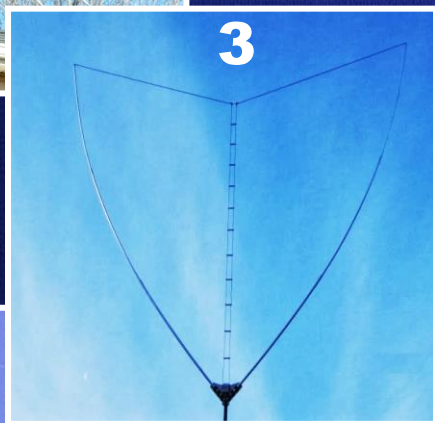
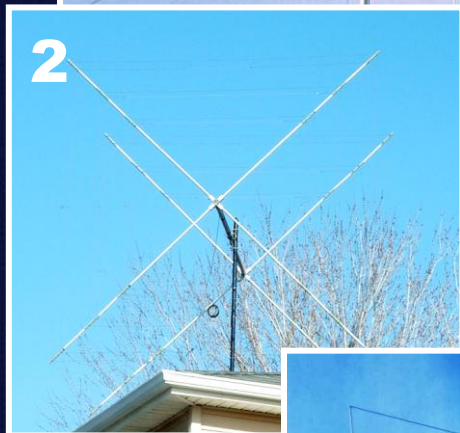
The $\frac{1}{4}$ -wavelength design is a lot like a $\frac{1}{2}$ -wavelength dipole cut in half and turned on end. The missing part of the dipole is supplied by an electrical mirror of sorts, called a *ground screen* or *ground plane*.

A ground screen is made up of a dozen or more wires stretched out radially from the base of the antenna and laid on top of the ground. The feed line connects to the vertical tube (it can also be a wire) and to the radials, which are all connected. The $\frac{1}{4}$ -wavelength verticals are fairly easy to construct and, like dipoles, work on odd multiples of their lowest design frequency.

Ground-independent verticals are about twice as long as their $\frac{1}{4}$ -wavelength counterparts but don't require a ground screen. The lack of a ground screen means that you can mount them on masts or structures above the ground. The feed line is connected to the end of the vertical but requires a special impedance matching circuit to work with low-impedance coaxial feed lines.

Several commercial manufacturers offer ground-independent verticals, and many hams with limited space or opportunities for traditional antennas make good use of them. Both types of verticals can work on several bands through the use of the similar techniques used in wire antennas. Commercial multiple-band verticals work on up to nine of the HF bands.





BEAM ANTENNAS

The most common HF beam (Yagi) today is a three-element design (a reflector, a driven element, and a director) that works on three popular ham bands (20, 15, and 10 meters) and so is called a *tri-bander*. Photo 1 is a three-element Yagi beam on a 55-foot mast whose lowest operating frequency is 14 MHz.

Other HF beams are made from square or triangular loops. They work on the same principle as the Yagi, but with loops of wire instead of straight elements made from rod or tubing. Square-loop beams are called *quads* (photo 2), and the triangles are called *delta loops* (photo 3). *Hex beams* (photo 4) are configured in circles. Log periodic beams (photo 5) are also used on the HF bands, with popular models available that cover 20 through 10 meters.

Whereas wire antennas have a fixed orientation and verticals radiate equally in all horizontal directions, a beam antenna can be rotated, which allows you to concentrate your signal or reject an interfering signal in a certain direction.

You can place small HF beams on inexpensive masts or rooftop tripods, although they overload most structures designed for TV antennas. You also need a *rotator* that mounts on the fixed support and turns the beam. You can control the rotator from inside the shack with a meter to indicate direction.

Most hams start on HF with a wire or vertical antenna. After you operate for a while, the signals you hear on the air will give you a good idea of what antennas are effective. After you have some on-the-air experience, you can decide if you need a beam antenna.



SPACE RADIO: VOYAGER 1 & 2

Some Mind-Boggling Facts

This year marks the 10th anniversary of when space probes Voyager 1 & Voyager 2 left the solar system. Their primary missions were the exploration of Jupiter and Saturn. They discovered active volcanoes on Jupiter's moon Io as well as the intricacies of Saturn's rings. Although pictures from Voyager 2 of Uranus were somewhat disappointing, Neptune's pictures were fantastic. Voyager 1 was launched on Sept. 5, 1977, and Voyager 2 was launched on Aug. 20, 1977. Both have now passed the heliosphere (the outermost atmospheric layer of the Sun), and are now travelling through interstellar space.

As of this year, Voyager 1 is about 14.5 billion miles from Earth, and Voyager 2 has traveled about 11.5 billion miles.

Although being used very conservatively to save battery power, amazingly the radios and some of the electronics on each spacecraft *are still operating!* Although Voyager 2 went silent at the beginning of this year, on Feb. 7 in an incredible feat of remote engineering, NASA fixed the spacecraft, now one of the most intrepid explorers in human history. They were able to bring Voyager 2 back online, resuming its mission to collect scientific data on the solar system and the interstellar space beyond.

A round-trip transmission to and from the spacecrafts now takes about 34 hours.

Let's all look forward to the time when Voyager 2 reaches the first star.....about 40,000 years from now.

ATTENTION NEWCOMER HAMS IN BVRC! !!!

ELMER 9 1 1



BVRC has over 30 experienced operators enrolled in ELMER 9-1-1 to assist new hams with questions and issues they might have.

These volunteer Elmers span years of experience in ham radio from antennas to radios to technical issues to emergency communications, and more. Many of them are at the weekly BVRC Saturday breakfasts in Bella Vista and the monthly BVRC meetings where you can discuss with them any topic that you are needing help with, in person.

However, if something crops-up and you need help fairly quickly, or you're unable to attend one of the weekly breakfasts or monthly meetings, you can obtain assistance via the BVRC website ELMER 9-1-1 tab:

www.bellavistaradioclub.org/elmer-911/

Here, you can complete and submit an online form. You will then receive a response via e-mail shortly thereafter, with help and advice.

Be sure and avail yourself to this valuable service when/if you need it. The Elmers are here for you. They know what it's like to be in a predicament and unsure of what to do when you're new to the hobby. They are here to help you, just as their Elmer helped them!

If you're unsure about something, get some help! ELMER 9-1-1 !



Why — Ham Radio Endures



Somehow it makes little sense that amateur “ham” radio continues to thrive in the age of Twitter, Facebook and iPhones. Yet the century-old communications technology — which demands such commitment that you must pass an exam to receive a license — currently attracts around 350,000 practitioners in Europe, and a further 800,000+ in the United States, some 60 per cent more than 30 years ago.

What is it about a simple microphone, a transmitter-receiver and the seductive freedom of the open radio spectrum that’s turned a low-tech anachronism into an enduring and deeply engaging global hobby?

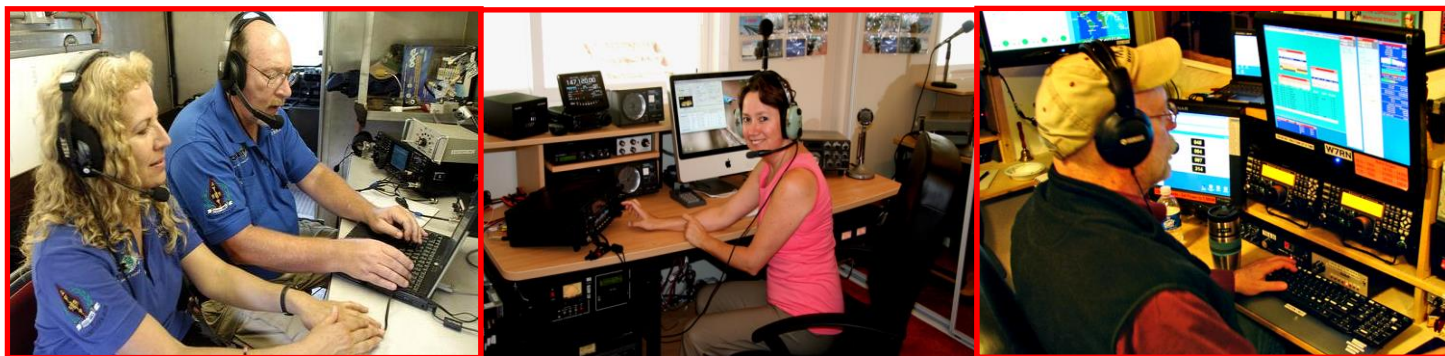
For a start, there is that thrill in establishing a magical person-to-person long-distance radio conversation that no commodified internet communication can compete with. In a world of taken-for-granted torrents of e-mails, instant messages and Skype video-chats, there is a purity and a richness in the shared experience of exchanging “73s” during a live “QSO” with strangers on another continent.

Why, the very ham slang that defines the community — 73 translating as “best regards”, and QSOs as two-way conversations — tells practitioners that they belong to a special, mutually curious and highly courteous club. Even today with electronic confirmations, the fact that DXers (long-distance amateur operators) still sometimes take the trouble to acknowledge received transmissions and conversations by sending their new contacts a custom-designed postcard through the analog postal service. — Well, that is charm itself in a world where it’s considered excessive to end a communication with anything more effusive than a “bestest”.

You only need study a handful of these cards to understand, even today, the old-fashioned excitement of connecting with a stranger who might be many thousands of miles away. The postcards — known as QSL cards — can be as quirky and personality-filled as the senders themselves. At times humorous and characterful, at others terse and geographically factual, they have naturally inspired their own subculture that has spurred DXers to collect and display them much as they would colorful foreign postage stamps.

The cards invariably display as a minimum some basic factual information about the sender. This will generally include the radio operator’s individual call sign, his (there are not too many “hers”) location, and a few details about the signal detected. And just to show that the Twitter generation did not invent the linguistic contractions exemplified in text-message speak, QSL cards to rely on slang and abbreviations to pack information into a tight space.

So cards will display the “RST” — the received radio station’s readability, signal and strength; perhaps details of the sender’s “XCXVR” (transceiver) and “ANT” (antenna); and occasionally a request to reciprocate, expressed as the shorthand “PSE QSL TNX” (please send an acknowledgement card, thanks) or the more chatty “HW ABT A QSL OM?” (How about a card, old man?) Old man, by the way, is not a reference to the recipient’s age — just as, on the rare occasions when the DXer is female, she is referred to as a “YL”, a young lady, whatever her chronological age.



DXers have been exchanging QSL cards since at least 1916, when Edward Andrews of Philadelphia — call sign 3TQ — recorded the receipt of a card from 8VX of Buffalo, NY. Over the next decade, the hobby took off — so much so that, by 1928, Paul Segal (W9EEA) had formulated an “amateur’s code” setting out six key qualities to which practitioners must adhere: “The radio amateur is considerate... loyal ... progressive ... friendly ... balanced ... [and] patriotic,” Segal specified, always ready for service to country and community.

Since then, the hobby has captivated royalty and celebrities alike. Among the most celebrated DXers have been the late King Hussein of Jordan (call sign JY1). And if monarchs have never appealed, you could instead have shot the breeze with Marlon Brando (FO5GJ), prime minister Rajiv Ghandi of India (VU2RG) or the CBS anchorman Walter Cronkite (KB2GSD) — not forgetting the singers Cliff Richards (W2JOF) or Joe Walsh of The Eagles (WB6ACU).

It’s little wonder that collectors describe the buzz of receiving a new exotic foreign card as akin to that of philatelists discovering a rare commemorative stamp. That explains why the late Jerry Powell, a New Jersey ham between 1928 to 2000 (W2OJW), proudly displayed the 369 cards he had gathered from Okinawa to Papua. (Again, in modern times, electronic QSLs have come into play due to the high cost of international postage, the extended time period involved, and the discontinuance of International Reply Coupons. However, hard copy QSLs still play a significant role in DXCC confirmations.)

Plus, of course, the chance to be a genuine real-life hero.....Days after a magnitude 7.3 earthquake devastated Haiti, amateur radio operators were busy at work connecting rescuers within the country and contacting survivors’ families. When a magnitude 8.8 earthquake hit Chile, and the phone network collapsed, a radio operator named Alejandro Jara broadcast the first information from the ground.

Hams stepped-in on September 11, 2001, and during Hurricane Katrina. Then there was Tony Pole-Evans, a bird lover with a short-wave radio on Saunders Island, who famously risked his life during Argentina’s 1982 invasion of the Falkland Islands to radio the first news back to Britain that 1,000 soldiers had landed on Goose Green.

How exciting it must have been to intercept that particular radio call. And boy, what a QSL card to top one’s collection. You can “tweet” all you like, but *this* is the way to communicate.

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